भारतीय मानक
Indian Standard

IS 1155 : 2022

आटा — विशिष्टि

(तीसरा पुनरीक्षण)

Atta — Specification

(Third Revision)

ICS 67.060

भारतीय मानक ब्यूरो
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FOREWORD

This Indian Standard (Third Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Foodgrains, Allied Products and Other Agricultural Produce Sectional Committee had been approved by the Food and Agriculture Division Council.

Atta, popularly known in English as wheat meal or whole wheat flour as distinct from *maida* (*see* IS 1009), contains bran as well, though the larger particles of bran are preferably sifted out. Practically all the great bulk of *atta* consumed in rural areas in India is produced by grinding wheat in stone mills worked either by hand or by animals. In urban areas, it is produced largely in mechanically operated stone mills and in roller flour mills. This standard is, therefore, intended to cover all types of *atta* whether produced in stone mills or in roller flour mills.

This standard was first published in 1957 and subsequently revised in 1965 to include two grades of *atta* besides incorporating modifications in the requirement for crude fibre content. Since compulsory washing of wheat before milling was introduced in the country, second revision was brought out in 1968 to raise the limit for moisture content, delete the requirement for acidity and revise the limits of acid insoluble ash and alcoholic acidity in *atta*.

This third revision is being undertaken to align the requirements of *atta* with the specifications laid down in the *Food Safety and Standards* (*Food Products Standards and Food Additives*) *Regulations*, 2011 and *Wheat Atta Grading and Marking Rules*, 1993. Following major changes have been incorporated in the current revision:

a) requirements for special and Standard grades of *atta* have been introduced, while deleting the requirements of high grade and low grade *atta*; and

b) specification of uric acid has been included.

In the formulation of this standard, due consideration has been given to the provisions of the *Food Safety and Standards Act*, 2006 and the *Rules* and *Regulations* framed thereunder and the *Legal Metrology* (*Packaged Commodities*) *Rules*, 2011. However, this standard is subject to the restrictions imposed under these, wherever applicable.

The composition of the Committee responsible for the formulation of this standard is given in Annex H.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

ATTA — SPECIFICATION

(Third Revision)

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for *atta* (whole wheat flour).

2 REFERENCES

The standards given below contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of these standards.

IS No.	*Title*
265 : 1993	Hydrochloric acid (*fourth revision*)
460 (Part 1) : 2020	Test sieves : Part 1 Wire cloth test sieves (*fourth revision*)
1070 : 1992	Reagent grade water — Specification (*third revision*)
2491 : 2013	Food hygiene — General principles — Code of practice (*third revision*)
3984 : 2002	Textiles — DW-flour bags — Specification (*first revision*)
4333 (Part 5) : 1970	Methods of analysis for foodgrains: Part 5 Determination of uric acid
12100 : 1987	Specification for high density polyethylene (HDPE) woven sacks for packing flour
14818 : 2017/ ISO 24333 : 2009	Cereal and cereal products — Sampling (*first revision)*

3 GRADES

The material shall be of two grades, namely, special and standard.

4 REQUIREMENTS

4.1 Description

The product shall be obtained by milling/grinding sound and clean wheat which includes the product prepared either in stone mills, disc mills or roller flour mills. The product in the form of powder shall be whitish to light brown in colour having characteristic taste and flavor. It shall be free from rancidity, insect, rodent or fungus infestation. It shall also be free from fermented, musty or other objectionable odour. It shall not have any adulterants and other extraneous matter, such as rodent hair or excreta. The *atta* shall be safe and fit for human consumption.

NOTE — The appearance, taste and odour shall be determined by organoleptic tests.

4.2 Microscopic Appearance

When the product is subjected to microscopic examination, starch granules shall have the characteristic appearance as shown in photomicrograph reproduced in Fig. 1, revealing concentric rings and more small granules than large ones, their size varying between 5 to 50 µm in diameter.

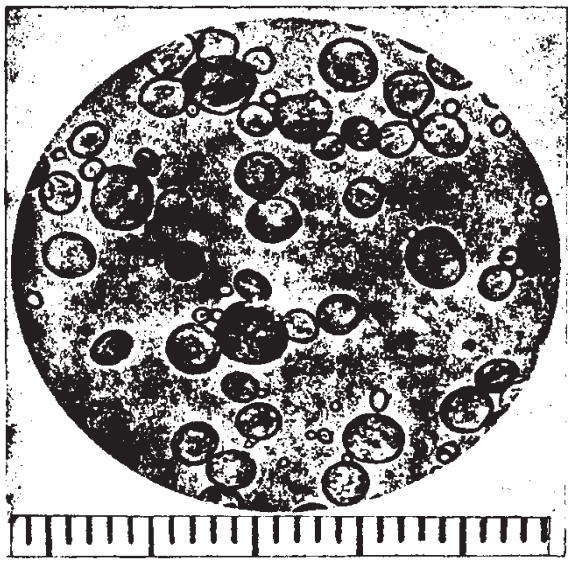

FIG. 1 PHOTOMICROGRAPH OF WHEAT STARCH (X 325) (SCALE: 1 DIVISION = 10 MICRONS)

4.3 The product shall be manufactured in premises using equipment maintained under hygienic conditions (*see* IS 2491).

4.4 The product shall also comply with the requirements given in Table 1.

Table 1 Requirements for *Atta*

(*Clause* 4.4)

Sl No.	Characteristic	Requirements of grades		Method of Test, Ref to
		Special	Standard	
(1)	(2)	(3)	(4)	(5)
i)	Moisture, percent by mass, *Max*	12.0	13.5	Annex A
ii)	Total ash (on dry basis), percent by mass, *Max*	2.0	2.0	Annex B
iii)	Acid insoluble ash (on dry basis), percent by mass, *Max*	0.10	0.10	Annex C
iv)	Gluten (on dry basis), percent by mass, *Min*	9.0	6.5	Annex D
v)	Crude fibre (on dry basis), percent by mass, *Max*	2.5	2.5	Annex E
vi)	Alcoholic acidity (as H_2SO_4) in 90 percent alcohol, percent by mass, *Max*	0.12	0.18	Annex F
vii)	Granularity	Not less than 99.8 percent by (*mass*) of the material shall pass through 600 micron IS Sieve	Not less than 98 percent by (*mass*) of the material shall pass through 600 micron IS Sieve	Annex G
viii)	Uric acid, mg/kg, *Max*	100	100	IS 4333 (Part 5)

4.5 Food Additives

The product shall not contain any food additives.

4.6 Contaminants, Toxins and Residues

The pesticide residues, heavy metals, toxins (aflatoxins and other naturally occurring toxins), if any, in the product shall not exceed the limits as prescribed in the *Food Safety and Standards* (*Contaminants, Toxins and Residues*) *Regulations*, 2011.

5 PACKING AND MARKING

5.1 Packing

5.1.1 The product shall be packed in quantities as stipulated under the *Legal Metrology* (*Packaged Commodities*) *Rules*, 2011 as well as in accordance with requirements under the *Food Safety and Standards Act*, 2006 and the *Rules* and *Regulations* framed thereunder.

5.1.2 The product may be packed in DW-flour bags (*see* IS 3984) or HDPE woven sacks (*see* IS 12100).

5.2 Marking

5.2.1 The ink used for marking shall be of such quality which may not contaminate the product. Information for non-retail containers shall be given either on the container or in accompanying documents. Each bag shall be suitably marked as to give the following information:

a) Name of the product '*Atta*';
b) Month and year of manufacture;
c) Name and address of the manufacturer;
d) Batch or Code number;
e) Net quantity;
f) Best before……...month…….year; and
g) Any other information required under the *Legal Metrology* (*Packaged Commodities*) *Rules*, 2011 and the *Food Safety and Standards* (*Labelling and Display*) *Regulations,* 2020.

5.2.2 *BIS Certification Marking*

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

6 SAMPLING

Representative samples of the product for ascertaining conformity to the requirements of this standard shall be drawn according to the method given in IS 14818.

7 TESTS

7.1 All the tests shall be carried out as specified in *col* 5 of Table 1.

7.2 Quality of Reagents

Unless specified otherwise, pure chemicals shall be employed in tests and distilled water (*see* IS 1070) shall be used where the use of water as reagent is intended.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the test results.

ANNEX A

[*Table* 1, *Sl. No.* (i)]

DETERMINATION OF MOISTURE CONTENT

A-1 PROCEDURE

Weigh accurately about 5 g of the material in a dish made of aluminium, porcelain, silica or platinum, previously dried in an electric oven and weighed. Place the dish in an electric oven maintained at 130 to 133 °C for two hours. Cool the dish in a desiccator and weigh with the lid on. Repeat the process of heating, cooling and weighing at half-hour intervals until the loss in weight between two successive weighings is less than 1 mg. Record the lowest mass obtained.

NOTE — Preserve the dish containing this dried material in a desiccator for the determination of total ash (*see* **B-1**) and crude fibre (*see* **E-2**).

A-2 CALCULATION

Moisture, percent by mass =

$$\frac{100\,(W_1 - W_2)}{(W_1 - W)}$$

where

W_1 = mass in g, of the moisture dish with the material before drying;

W_2 = mass in g, of the moisture dish with the material after drying; and

W = mass in g, of the empty moisture dish.

ANNEX B

[*Table* 1, *Sl. No.* (ii)]

DETERMINATION OF TOTAL ASH

B-1 PROCEDURE

Ignite the dried material in the dish (*see* **A-1**) with the flame of a suitable burner for about one hour. Complete the ignition by keeping in a muffle furnace at 550 to 600 °C until grey ash results. Cool in a desiccator and weigh. Repeat the process of igniting, cooling and weighing at half-hour intervals until the difference between two successive weighings is less than 1 mg. Note the lowest mass.

NOTE — Preserve this ash for the determination of acid insoluble ash (*see* **C-2**).

B-2 CALCULATION

Total ash (on dry basis), percent by mass =

$$\frac{100\,(W_1 - W_2)}{(W_1 - W)}$$

where

W_2 = mass in g, of the dish with the ash;

W = mass in g, of the empty dish; and

W_1 = mass in g, of the dish with the dried material taken for the test.

ANNEX C

[*Table* 1, *Sl. No.* (iii)]

DETERMINATION OF ACID INSOLUBLE ASH

C-1 REAGENT

C-1.1 Dilute Hydrochloric Acid, approximately 5 N, prepared from concentrated hydrochloric acid (*see* IS 265).

C-2 PROCEDURE

To the ash contained in the porcelain or silica dish (**B-1**), add 25 ml of dilute hydrochloric acid, cover with a watch-glass and heat on a water-bath for 10 min. Allow to cool and filter the contents of the dish through Whatman filter paper No. 42 or its equivalent. Wash the filter with distilled water until the washings are free from the acid. Return the filter and the residue to the dish. Keep it in an electric air-oven maintained at 130 to 133 °C for about 3 h. Ignite in a muffle furnace at about 550 to 600 °C for one hour. Cool the dish in a desiccator and weigh. Repeat the process of igniting in the muffle furnace, cooling and weighing at half-hour interval until the difference between two successive weighings is less than 1 mg. Note the lowest mass.

C-3 CALCULATION

Acid insoluble ash (on dry basis), percent by mass =

$$\frac{100\,(W_2 - W)}{(W_1 - W)}$$

where

W_2 = mass in g, of the dish with the acid insoluble ash;

W = mass in g, of the empty dish; and

W_1 = mass in g, of the dish with the dried material taken for the determination of total ash (*see* **B-1**).

ANNEX D

[*Table* 1, *Sl. No.* (iv)]

DETERMINATION OF GLUTEN

D-1 PROCEDURE

Weigh accurately into a dish about 25 g of the material. Add about 15 ml of water to the material and make it into a dough, taking care to see that all the material is taken into the dough. Keep the dough gently in a beaker filled with water and let it stand for 1 h. Remove the dough and place it in a piece of bolting silk cloth with an aperture of 0.16 mm size (No. 10 XXX) or 150 micron IS Sieve [*see* IS 460 (Part 1)] and wash it with a gentle stream of tap water till water passing through the silk does not turn blue when a drop of iodine solution is added to it. Spread the silk tight on a porcelain plate for facilitating scraping. Transfer the residue from the silk by means of a spatula, to a tared porcelain or silica dish. Spread the wet gluten into a thin layer and cut into small pieces. Transfer any residue sticking to the spatula into the dish. Place the dish in an air-oven maintained at 133 ± 2 °C. Dry for 2 h, cool in a desiccator and weigh.

D-2 CALCULATION

Gluten (on dry basis), percent by mass =

$$\frac{10\,000\,(W_2 - W_1)}{W\,(100 - W_3)}$$

where

W_2 = mass in g, of the dish with dry gluten;

W_1 = mass in g, of the empty dish;

W = mass in g, of the material take for the test; and

W_3 = percentage of the moisture in the sample (*see* **A-2**).

ANNEX E

[*Table* 1, *Sl. No.* (v)]

DETERMINATION OF CRUDE FIBRE

E-1 REAGENTS

E-1.1 Dilute Sulphuric Acid, 1.25 percent (*w/v*), accurately prepared.

E-1.2 Sodium Hydroxide Solution, 1.25 percent (w/v), accurately prepared.

E-1.3 Ethyl Alcohol, 95 percent by volume.

E-2 PROCEDURE

Weigh accurately about 2.5 g of the material preserved under **A-1** and transfer it to a liter flask. Take 200 ml of dilute sulphuric acid in a beaker and bring to the boil. Transfer the whole of the boiling acid to the flask containing the fat-free material and immediately connect the flask with a water-cooled reflux condenser and heat, so that the contents of the flask begin to boil within one minute. Rotate the flask frequently, taking care to keep the material from remaining on the sides of the flask and out of contact with the acid. Continue boiling for exactly 30 min. Remove the flask and filter through fine linen (about 18 threads to the centimeter) held in a funnel, and wash with boiling water until the washings are no longer acid to litmus. Bring to the boil some quantity of sodium hydroxide solution under a reflux condenser. Wash the residue on the linen into the flask with 200 ml of the boiling sodium hydroxide solution. Immediately connect the flask with the reflux condenser and boil for exactly 30 min. Remove the flask and immediately filter through the filtering cloth. Thoroughly wash the residue with boiling water and transfer to a Gooch crucible prepared with a thin but compact layer of ignited asbestos. Wash the residue thoroughly first with hot water and then with about 15 ml of ethyl alcohol, 95 percent by volume. Dry the Gooch crucible and contents at 105 ± 2 °C in an air-oven to constant mass. Cool and weigh. Incinerate the contents of the Gooch crucible in an electric muffle furnace at 600 ± 20 °C until all the carbonaceous matter is burnt. Cool the Gooch crucible containing the ash in a desiccator and weigh.

E-3 CALCULATION

Crude fibre (on dry basis), percent by mass =

$$\frac{100\,(W_1 - W_2)}{W}$$

where

W_1 = mass in g, of Gooch crucible and contents before ashing;

W_2 = mass in g, of Gooch crucible containing asbestos and ash; and

W = mass in g, of the dried material taken for the test.

ANNEX F

[*Table* 1, *Sl. No.* (vi)]

DETERMINATION OF ALCOHOLIC ACIDITY

F-1 REAGENTS

F-1.1 Neutral Ethyl Alcohol, 90 percent (*v/v*).

F-1.2 Standard Sodium Hydroxide Solution, 0.05 N.

F-1.3 Phenolphthalein Indicator Solution, dilute 0.1 g of phenolphthalein in 100 ml of 60 percent (*v/v*) rectified spirit.

F-2 PROCEDURE

Weigh 5 g of sample into a conical stoppered flask and add 50 ml of neutral ethyl alcohol. Stopper, shake and allow to stand for 24 h, with occasional shaking. Filter the alcoholic extract through a dry filter paper. Titrate the combined alcoholic extract against 0.05 N standard sodium hydroxide solution using phenolphthalein as indicator. Calculate the percentage of alcoholic acidity as sulphuric acid.

F-3 CALCULATION

Alcoholic acidity (as H_2SO_4) in 90 percent alcohol, percent by mass =

$$\frac{4.9\ AN}{M}$$

where

A = volume in ml, of standard sodium hydroxide solution used in titration;

N = normality of standard sodium hydroxide solution; and

M = mass in g, of the material taken for the test.

ANNEX G

[*Table* 1, *Sl. No.* (vii)]

DETERMINATION OF GRANULARITY

G-1 PROCEDURE

G-1.1 Transfer about 10 g of the material to 600 micron IS Sieve (*see* Note) and sieve for 2 min. Brush the upper surface of the sieve and sieve again for one minute.

NOTE — In case 600 micron IS Sieve [conforming to IS 460 (Part 1)] is not available, BS Test Sieve 25, ASTM Sieve 30 or Tyler Test Sieve 28, which have their apertures within the limits specified for this IS Sieve, may be used.

G-1.2 Weigh the amount of material pass through the sieve.

ANNEX H

(*Foreword*)

COMMITTEE COMPOSITION

Foodgrains, Allied Products and Other Agricultural Produce Sectional Committee, FAD 16

Organization	*Representative(s)*
Directorate of Marketing and Inspection, Ministry of Agriculture, New Delhi	Shri P. K. Swain (***Chairman***) Additional Secretary (Agriculture Marketing),
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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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